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A Potential Timber-Type Chinese Chestnut

Fifty years ago the chestnut blight (Endothia parasitica) was discovered in New York City. Since then the American chestnut (Castanea dentata) has practically disappeared from our forests.

More than 500 importations of seed and scions of nearly every Castanea species in the world have been made in efforts to obtain a substitute for the valuable American chestnut. One importation (accession number P.I.58602) shows promise as a timber type. This conclusion is based on

Figure 1.--Chinese chestnut P.I.58602 grows like a forest tree when planted on a good site and spaced 15 feet apart. This 30-year-old plantation is growing in Jackson County, North Carolina. The 10 best trees average 8.6 inches in diameter and 62.5 feet high.

observations of more than 800 test plantings. These plantings are distributed from Maine to Texas, and as far west as Iowa.

In 1924, and again in 1926, the Department of Agriculture received shipments of Chinese chestnut seed from the University of Nanking in China. This was the original source of stock for the accession P.I.58602. Almost 10,000 seedlings were grown from this collection; they were distributed in lots of about 100 trees each to cooperators. When some of these trees reached nut-bearing age, further seed collections were made. To date more than 45,000 seedlings of P.I.58602 have been planted throughout the former range of American chestnut. Cooperators testing these Chinese chestnut seedlings include Federal and State foresters, tannin manufacturers, and a few interested farm woodlot owners.

The first clue to the timber-type possibilities of the Chinese chestnut P.I.58602 was noted by the writer in one of the original plantations in New Castle County, Del. These trees were planted in 1926 in typical Chester loam soil. In 1936 the most promising trees were about 4 inches in diameter and 33 feet in height, and had developed straight single-stemmed trunks. They were successfully competing with similar-aged natural hardwood seedlings of

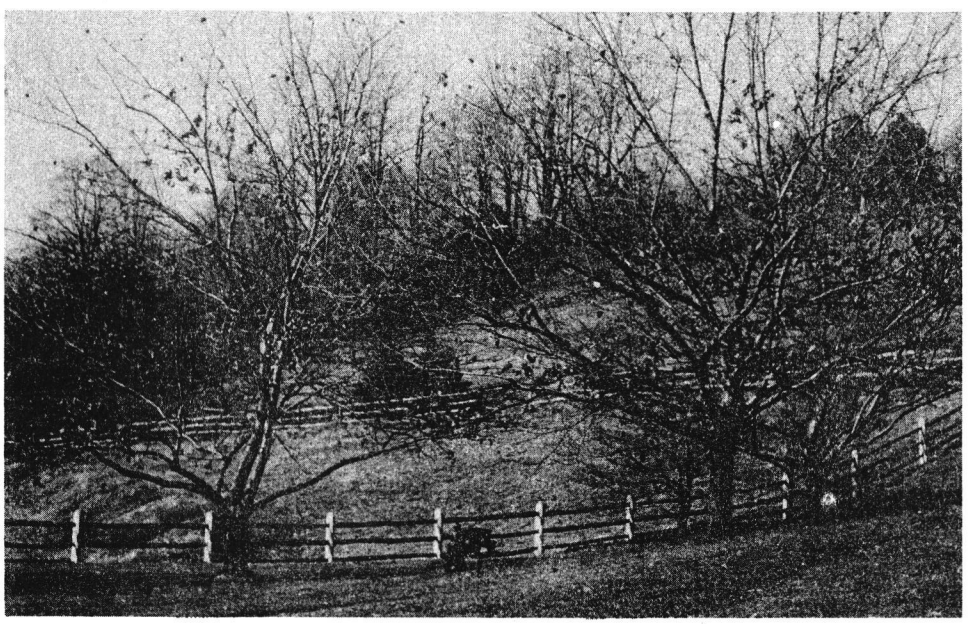

Figure 2.--Orchard-like crowns develop on open-grown trees of the Chinese chestnut P.I.58602. These two 30-year-old trees are in New Castle County, Delaware.

yellow-poplar, northern red oak, white ash, and black birch. Figure 1 illustrates trees of this type.

In this same plantation other P.I.58602 seedlings were growing in competition with dwarf sumac and broom sedge. Under these conditions the Chinese chestnut seedlings were barely 6 feet in height, with many stems and a sprawling habit of growth. This condition is typical of most open-grown Asiatic chestnuts. Figure 2 illustrates trees of this type.

This discovery prompted a systematic survey of all P.I.58602 Chinese chestnut plantings established in 1926. Three consistent facts were noted: (1) close planting resulted in a timber-form tree, but widely spaced trees had a sprawling habit of growth; (2) satisfactory growth and survival occurred only when the seedlings were planted on good soil, such as the kind that is suitable for yellow-poplar and white ash; and (3) Chinese chestnut P.I.58602 is relatively winter-hardy.

Table 1.--Comparative performance of Asiatic importations after 13 growing seasons in a plantation at Mont Alto State Forest, Adams County, Pennsylvania

Accession number[1]	Origin	Potential forest type	Average diameter	Average height	Mortality
		Percent	Inches	Feet	Percent
P.I.58602	Chinese	67	3.4	27.1	7
P.I.113667	"	71	3.0	24.2	14
P.I.104059	"	62	2.2	23.5	7
P.I.113666	"	29	2.1	24.0	7
P.I.113668	"	44	2.4	23.0	12
P.I.104020	Japanese	21	2.8	23.6	43
P.I.113662	Henry Chinkapin	31	2.4	22.4	38
P.I.104016	Japanese	12	2.6	19.0	63
P.I.104014	"	18	2.7	21.0	64

[1]Accession numbers assigned by the U. S. Dept. Agriculture Plant Introduction Station. Species are Chinese and Japanese chestnuts, with one forest-type chinkapin.

The comparative performance of Chinese chestnut P.I.58602, against eight other Asiatic importations, is in-

dicated in table 1. This Pennsylvania plantation is typical of other similar test plantings made in Indiana, Iowa, and North Carolina. The accession groups in the table are arranged in descending order of desirability as a timber-type tree. This arrangement was based mainly on the factors of form, size, and survival. However, other factors, such as relative winter-hardiness and disease resistance, also were considered in the ratings where this information was available.

Although preliminary observations indicate that the Chinese chestnut P.I.58602 may be a hardy timber-type tree of moderately rapid growth; it is too soon to predict that this particular introduction will surpass all others. Other importations made in the past, and promising first- and second-generation hybrids, also have to be compared with P.I.58602 over a wide range of growing conditions.

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